Based upon available dilution, Order No. R5-2002-0083 established an MDEL of 14.5 µg/L.

Tetrachloroethylene was not detected in the effluent discharge, based on 65 samples collected between 20 March 2002 and 10 January 2007, while the maximum observed upstream receiving water tetrachloroethylene concentration was <0.04 µg/L, based on 26 samples collected between 20 March 2002 and 15 November 2007. Therefore, the discharge does not demonstrate a reasonable potential to cause or contribute to an in-stream excursion above the NTR criterion for tetrachloroethylene. Based on new information and the procedures established in Section 1.3 of the SIP for determining reasonable potential, the discharge no longer demonstrates reasonable potential to exceed water quality criteria for tetrachloroethylene. The removal of the effluent limitations for tetrachloroethylene is in compliance with 40 CFR 122.44(l)(2)(i)(B)(1).

ff. **Trichloroethylene (TCE).** The CTR includes a trichloroethylene criterion of 2.7 µg/L for the protection of human health and is based on a one-in-a-million cancer risk for waters from which both water and organisms are consumed. Based upon available dilution, the previous order established an AMEL and MDEL of 14.5 µg/L and 34 µg/L, respectively.

Trichloroethylene was not detected (<0.05 µg/L) in 64 effluent monitoring samples collected between 20 March 2002 and 10 January 2007. Concentrations of trichloroethylene was not observed (<0.2 µg/L) in 26 upstream receiving water samples collected between 20 March 2002 and 15 November 2006. Based on new information and the procedures established in Section 1.3 of the SIP for determining reasonable potential, the discharge no longer demonstrates reasonable potential to exceed water quality criteria for trichloroethylene. The removal of the effluent limitations for trichloroethylene is in compliance with 40 CFR 122.44(l)(2)(i)(B)(1).

gg. **Toxicity.** See Section IV.C.5. of the Fact Sheet regarding whole effluent toxicity.

hh. **Total Trihalomethanes (THMs).** Information submitted by the Discharger indicates that the effluent contains THMs, including chloroform. The Basin Plan contains the narrative "chemical constituent" objective that requires, at a minimum, that waters with a designated MUN use not exceed California MCLs. In addition, the chemical constituent objective prohibits chemical constituents in concentrations that adversely affect beneficial uses. The California primary MCL for total THMs is 100 µg/L. The USEPA primary MCL for total THMs is 80 µg/L, which was effective on January 1, 2002 for surface water systems that serve more than 10,000 people. Pursuant to the Safe Drinking Water Act, DHS must revise the current total THMs MCL in Title 22, CCR to be as low or lower than the USEPA MCL. Total THMs include bromoform, dichlorobromomethane, chloroform, and chlorodibromomethane. The Cal/EPA Office of Environmental Health Hazard Assessment (OEHHA) has published the Toxicity Criteria Database, which contains cancer potency factors for chemicals, including

chloroform, that have been used as a basis for regulatory actions by the regional boards, departments, and offices within Cal/EPA. This cancer potency factor is equivalent to a chloroform concentration in drinking water of 1.1 µg/L (ppb) at the 1-in-a-million cancer risk level with an average daily consumption of two liters of drinking water over a 70-year lifetime.

MUN is a designated beneficial use of the Delta. However, there are no known active drinking water intakes in the San Joaquin River for several miles downstream of the discharge, and chloroform is a non-conservative pollutant. Therefore, to protect the MUN beneficial use of the receiving waters, the Regional Water Board finds that, in this specific circumstance, application of the USEPA MCL for total THMs for the effluent is appropriate, as long as the receiving water does not exceed the OEHHA cancer potency factor's equivalent receiving water concentration at a reasonable distance from the outfall. Typically, in NPDES permits, the OEHHA public health goal is not used to base effluent limitations when there are no active drinking water intakes in the vicinity of the discharge, because chloroform is a volatile organic constituent that will degrade in the environment. If there are no intakes near the discharge, the MCL for total THMs is used with receiving water monitoring for chloroform to determine if the constituent is degrading in the environment before reaching any drinking water intakes.

The MEC for total THMs was 78 µg/L, based on 64 samples. There is only one detection of any of the THMs in the background receiving water (chloroform includes an estimated concentration (i.e. j-flag) of 0.3 µg/L. Therefore, total THMs in the discharge does not have a reasonable potential to cause or contribute to an in-stream excursion above the USEPA primary MCL for total THMs and an effluent limitation is not necessary. The previous Order No. R5-2002-0083 included an effluent limitation for chloroform based on EPA's National Ambient Water Quality Criteria for chloroform (i.e. 5.7 µg/L for consumption of water and organisms). However, USEPA has reserved the National Ambient Water Quality Criteria for water and fish for chloroform and is developing new criteria. Therefore, the primary MCL for total THMs is used to regulate chloroform in NPDES permits at this time. Since the discharge does not have reasonable potential to exceed the primary MCL for total THMs, the effluent limitations for chloroform have not been carried forward to this Order. The removal of the effluent limitations for chloroform is in compliance with 40 CFR 122.44(l)(2)(i)(B)(1).

4. WQBEL Calculations

a. As discussed in Section IV.C.3 above, the annual average effluent limitation for aluminum was based on the Secondary MCL, for protection of the MUN beneficial use, and applied directly. For nitrate plus nitrite, and manganese, performance-based effluent limitation were calculated as the mean plus 3.3 standard deviations based on the most recent monitoring data. For molybdenum, a performance-based effluent limitation was established as the maximum effluent concentration based on the most recent monitoring data.

For EC, a performance-based effluent limitation was established as the highest annual average effluent concentration based on the most recent monitoring data. For ammonia, total coliform, dissolved oxygen, pH, temperature, and chlorine residual, the effluent limitations from the previous Order were carried over.

b. Effluent limitations for aluminum, bis(2-ethylhexyl)phthalate, chlorodibromomethane, cyanide, and dichlorobromomethane were calculated in accordance with section 1.4 of the SIP. The following paragraphs describe the methodology used for calculating effluent limitations for these parameters.

c. **Effluent Limitation Calculations.** In calculating maximum effluent limitations, the effluent concentration allowances were set equal to the criteria/standards/objectives.

$$ECA_{acute} = CMC \qquad ECA_{chronic} = CCC$$

For the human health, agriculture, or other long-term criterion/objective, a dilution credit can be applied. The ECA is calculated as follows:

$$ECA_{HH} = HH + D(HH - B)$$

where:

ECA_{acute} = effluent concentration allowance for acute (1-hour average) toxicity criterion

$ECA_{chronic}$ = effluent concentration allowance for chronic (4-day average) toxicity criterion

ECA_{HH} = effluent concentration allowance for human health, agriculture, or other long-term criterion/objective

CMC = criteria maximum concentration (1-hour average)

CCC = criteria continuous concentration (4-day average, unless otherwise noted)

HH = human health, agriculture, or other long-term criterion/objective

D = dilution credit

B = maximum receiving water concentration

Acute and chronic toxicity ECAs were then converted to equivalent long-term averages (LTA) using statistical multipliers and the lowest is used. Additional statistical multipliers were then used to calculate the maximum daily effluent limitation (MDEL) and the average monthly effluent limitation (AMEL).

Human health ECAs are set equal to the AMEL and a statistical multiplier is used to calculate the MDEL.

$$AMEL = mult_{AMEL}\left[\min\left(\underbrace{M_A ECA_{acute}}_{LTA_{acute}}, M_C ECA_{chronic}\right)\right]$$

$$MDEL = mult_{MDEL}\left[\min\left(M_A ECA_{acute}, \underbrace{M_C ECA_{chronic}}_{LTA_{chronic}}\right)\right]$$

$$MDEL_{HH} = \left(\frac{mult_{MDEL}}{mult_{AMEL}}\right) AMEL_{HH}$$

where: $mult_{AMEL}$ = statistical multiplier converting minimum LTA to AMEL
$mult_{MDEL}$ = statistical multiplier converting minimum LTA to MDEL
M_A = statistical multiplier converting CMC to LTA
M_C = statistical multiplier converting CCC to LTA

WQBELs were calculated for aluminum, bis(2-ethylhexyl) phthalate, chlorodibromomethane, cyanide, and dichlorobromomethane as follows in Tables F-7 through F-11, below.

Table F-7. WQBEL Calculations for Aluminum

	Acute	Chronic
Criteria (µg/L) [1]	750	750
Dilution Credit	No Dilution	No Dilution
ECA	750	750
ECA Multiplier	0.22	0.40
LTA	168.39	303.21
AMEL Multiplier (95th%)	1.85	[2]
AMEL (µg/L)	**311**	[2]
MDEL Multiplier (99th%)	4.45	[2]
MDEL (µg/L)	**750**	[2]

[1] USEPA Ambient Water Quality Criteria
[2] Limitations based on acute LTA (Acute LTA < Chronic LTA)

Table F-8. WQBEL Calculations for Bis(2-ethylhexyl)Phthalate

	Human Health
Criteria (mg/L)	1.8
Dilution Credit	0
ECA	1.8
AMEL (mg/L)[1]	**1.8**
MDEL/AMEL Multiplier[2]	2.01
MDEL (mg/L)	**3.6**

[1] AMEL = ECA per section 1.4.B, Step 6 of SIP
[2] Assumes sampling frequency n<=4. Uses MDEL/AMEL multiplier as determined in Step 5 of Section 1.4 of the SIP.

Table F-9. WQBEL Calculations for Chlorodibromomethane

	Human Health
Criteria (mg/L)	0.41
Dilution Credit	13:1
ECA	4.97
AMEL (mg/L)[1]	**5.0**
MDEL/AMEL Multiplier[2]	3.29
MDEL (mg/L)	**16**

[1] AMEL = ECA per section 1.4.B, Step 6 of SIP
[2] Assumes sampling frequency n<=4. Uses MDEL/AMEL multiplier as determined in Step 5 of Section 1.4 of the SIP.

Table F-10. WQBEL Calculations for Dichlorobromomethane

	Human Health
Criteria (mg/L)	0.56
Dilution Credit	13:1
ECA	6.8
AMEL (mg/L)[1]	**6.8**
MDEL/AMEL Multiplier[2]	3.01
MDEL (mg/L)	**20**

[1] AMEL = ECA per section 1.4.B, Step 6 of SIP
[2] Assumes sampling frequency n<=4. Uses MDEL/AMEL multiplier as determined in Step 5 of Section 1.4 of the SIP.

Table F-11. WQBEL Calculations for Cyanide

	Acute	Chronic
Criteria (µg/L)[1]	22	5.2
Dilution Credit	No Dilution	No Dilution
ECA	22	5.2
ECA Multiplier	0.27	0.46
LTA	5.85	2.40
AMEL Multiplier (95th%)	[2]	1.70
AMEL (µg/L)	[2]	**4.1**
MDEL Multiplier (99th%)	[2]	3.76
MDEL (µg/L)	[2]	**9.0**

[1] USEPA Ambient Water Quality Criteria
[2] Limitations based on chronic LTA (Chronic LTA < Acute LTA)

5. Whole Effluent Toxicity (WET)

For compliance with the Basin Plan's narrative toxicity objective, this Order requires the Discharger to conduct whole effluent toxicity testing for acute and chronic toxicity, as specified in the Monitoring and Reporting Program (Attachment E, Section V.). This Order also contains effluent limitations for acute toxicity and requires the Discharger to implement best management practices to investigate the causes of, and identify corrective actions to reduce or eliminate effluent toxicity.

a. **Acute Aquatic Toxicity.** The Basin Plan contains a narrative toxicity objective that states, "*All waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life.*" (Basin Plan at III-8.00) The Basin Plan also states that, "*...effluent limits based upon acute biotoxicity tests of effluents will be prescribed where appropriate...*". USEPA Region 9 provided guidance for the development of acute toxicity effluent limitations in the absence of numeric water quality objectives for toxicity in its document titled "Guidance for NPDES Permit Issuance", dated February 1994. In section B.2. "Toxicity Requirements" (pgs. 14-15) it states that, "*In the absence of specific numeric water quality objectives for acute and chronic toxicity, the narrative criterion 'no toxics in toxic amounts' applies. Achievement of the narrative criterion, as applied herein, means that ambient waters shall not demonstrate for acute toxicity: 1) less than 90% survival, 50% of the time, based on the monthly median, or 2) less than 70% survival, 10% of the time, based on any monthly median. For chronic toxicity, ambient waters shall not demonstrate a test result of greater than 1 TUc.*" Effluent limitations for acute toxicity have been included in this Order as follows:

Survival of aquatic organisms in 96-hour bioassays of undiluted waste shall be no less than:

Minimum for any one bioassay----------	70%
Median for any three or more consecutive bioassays ---------	90%

The previous permit, Order No. R5-2002-0083, contained these same acute toxicity requirements. Based on the weekly acute toxicity test results conducted during December 2003 through January 2007, the Discharger demonstrated compliance with these acute toxicity requirements.

b. **Chronic Aquatic Toxicity.** Based on 116 monthly samples for whole effluent chronic toxicity testing performed by the Discharger from 2 February 2002 through 20 June 2006, the Discharger reported a maximum toxicity result for algal cell density, performed on *Selenastrum capricoruntum*, of greater than 16 TU_c. The Discharger conducted accelerated chronic toxicity testing for *Selenastrum capricornutum* as a result of final effluent toxicity, and conducted the required TIE studies. In January 2005, the Phase I TIE indicated that the effluent contaminant(s) responsible for chronic toxicity to *Selenestrum capricornutum* were primarily organic in nature (January and March 2005, TIE of the City of Stockton Effluent Toxicity to *Selenastrum capricornutum,* Pacific

EcoRisk). Subsequently, Phase II TIE procedures were initiated to identify the organic compound(s) responsible for final effluent toxicity; however, the testing indicated that the toxicity was not persistent (Phase II TIE of Stockton Effluent Toxicity to *Selenastrum capricornutum,* April 2005, Pacific EcoRisk). In total, during the period from March 2002 through March 2007, the Discharger conducted 132 WET tests and 9 TIE tests for Selenastrum capricornutum.

In April 2007, the Discharger concluded the TRE, and submitted the evaluation report to the Regional Water Board, *Assessment of the City of Stockton's Historic Whole Effluent Toxicity Testing and Toxicity Reduction Evaluation Programs for Selenastrum capriconutum*, Jones & Stokes Associates. The TRE identified the toxicant in the *Selenastrum capriconutum* bioassay as ammonia. Recent Facility upgrades that included new nitrification facilities are expected to reduce the occurrence of the toxicant ammonia, and as a result, subsequent accelerated monitoring concluded in October 2007 without further *Selenastrum capricornutum* (algae) toxicity.

Other WET testing data also demonstrated that the effluent discharge from the Facility has reasonable potential to cause or contribute to an in-stream excursion above the Basin Plan's narrative toxicity objective. During the period from 5 March 2002 through 13 June 2006, 52 samples resulted in a maximum toxicity of survival and growth for *Ceriodaphnia dubia* of 2 TU_c and 25 samples resulted in a maximum toxicity of 4 TU_c. No dilution has been granted for the chronic condition. Therefore, chronic toxicity testing results exceeding 1 chronic toxicity unit (TUc) demonstrates the discharge has a reasonable potential to cause or contribute to an exceedance of the Basin Plan's narrative toxicity objective.

Based upon the findings of the extensive WET testing and TIE/TRE, the WET procedure in the MRP allows the removal of the toxicant ammonia prior to conducting the WET analysis.

Numeric chronic WET effluent limitations have not been included in this Order. The SIP contains implementation gaps regarding the appropriate form and implementation of chronic toxicity limits. This has resulted in the petitioning of a NPDES permit in the Los Angeles Region[3] that contained numeric chronic toxicity effluent limitations. To address the petition, the State Water Board adopted WQO 2003-012 directing its staff to revise the toxicity control provisions in the SIP. The State Water Board states the following in WQO 2003-012, *"In reviewing this petition and receiving comments from numerous interested persons on the propriety of including numeric effluent limitations for chronic toxicity in NPDES permits for publicly-owned treatment works that discharge to inland waters, we have determined that this issue should be considered in a regulatory setting, in order to allow for full public discussion and deliberation. We intend to modify the SIP to specifically address the issue. We anticipate that*

[3] In the Matter of the Review of Own Motion of Waste Discharge Requirements Order Nos. R4-2002-0121 [NPDES No. CA0054011] and R4-2002-0123 [NPDES NO. CA0055119] and Time Schedule Order Nos. R4-2002-0122 and R4-2002-0124 for Los Coyotes and Long Beach Wastewater Reclamation Plants Issued by the California Regional Water Quality Control Board, Los Angeles Region SWRCB/OCC FILES A-1496 AND 1496(a)

review will occur within the next year. We therefore decline to make a determination here regarding the propriety of the final numeric effluent limitations for chronic toxicity contained in these permits." The process to revise the SIP is currently underway. Proposed changes include clarifying the appropriate form of effluent toxicity limits in NPDES permits and general expansion and standardization of toxicity control implementation related to the NPDES permitting process. Because the toxicity control provisions in the SIP are under revision, it is infeasible to develop numeric effluent limitations for chronic toxicity. Therefore, this Order requires that the Discharger meet best management practices for compliance with the Basin Plan's narrative toxicity objective, as allowed under 40 CFR 122.44(k).

To ensure compliance with the Basin Plan's narrative toxicity objective, the Discharger is required to conduct chronic whole effluent toxicity testing, as specified in the Monitoring and Reporting Program (Attachment E, Section V.). Furthermore, Special Provisions VI.C.2.a. of this Order requires the Discharger to investigate the causes of, and identify and implement corrective actions to reduce or eliminate effluent toxicity. If the discharge demonstrates a pattern of toxicity exceeding the numeric toxicity monitoring trigger, the Discharger is required to initiate a Toxicity Reduction Evaluation (TRE), in accordance with an approved TRE work plan. The numeric toxicity monitoring trigger is not an effluent limitation, it is the toxicity threshold at which the Discharger is required to perform accelerated chronic toxicity monitoring, as well as, the threshold to initiate a TRE if a pattern of effluent toxicity has been demonstrated.

D. Final Effluent Limitations

1. Mass-based Effluent Limitations

Title 40 CFR 122.45(f)(1) requires effluent limitations be expressed in terms of mass, with some exceptions, and 40 CFR 122.45(f)(2) allows pollutants that are limited in terms of mass to additionally be limited in terms of other units of measurement. This Order includes effluent limitations expressed in terms of mass and concentration. In addition, pursuant to the exceptions to mass limitations provided in 40 CFR 122.45(f)(1), some effluent limitations are not expressed in terms of mass, such as pH and temperature, and when the applicable standards are expressed in terms of concentration (e.g., CTR criteria and MCLs) and mass limitations are not necessary to protect the beneficial uses of the receiving water.

Mass-based effluent limitations were calculated for TSS, $CBOD_5$ and ammonia based upon the permitted average dry weather flow allowed in Section IV.A.1.g. of the Limitations and Discharge Requirements.

2. Averaging Periods for Effluent Limitations

Title 40 CFR 122.45 (d) requires average weekly and average monthly discharge limitations for publicly owned treatment works (POTWs) unless impracticable. However, for toxic pollutants and pollutant parameters in water quality permitting, the

USEPA recommends the use of a maximum daily effluent limitation in lieu of average weekly effluent limitations for two reasons. *"First, the basis for the 7-day average for POTWs derives from the secondary treatment requirements. This basis is not related to the need for assuring achievement of water quality standards. Second, a 7-day average, which could comprise up to seven or more daily samples, could average out peak toxic concentrations and therefore the discharge's potential for causing acute toxic effects would be missed."* (TSD, pg. 96) This Order utilizes maximum daily effluent limitations in lieu of average weekly effluent limitations for aluminum, ammonia, manganese, molybdenum, bis(2-ethylhexyl)phthalate, chlorodibromomethane, cyanide, and dichlorobromomethane as recommended by the TSD for the achievement of water quality standards and for the protection of the beneficial uses of the receiving stream. Furthermore, for TSS, $CBOD_5$, pH, and total coliform organisms, weekly average effluent limitations have been replaced or supplemented with effluent limitations utilizing shorter averaging periods. The rationale for using shorter averaging periods for these constituents is discussed in Attachment F, Section IV.C.3., above.

3. Satisfaction of Anti-Backsliding Requirements

Some effluent limitations in this Order are less stringent than those in the previous permit, Order No. R5-2002-0083. However, since the issuance of Order No. R5-2002-0083, the Discharger upgraded the Facility to provide a higher level of treatment, including a tertiary filtration system. Based upon this new information, as discussed below, this relaxation of effluent limitations is consistent with the anti-backsliding requirements of the CWA and federal regulations.

The previous permit, Order No. R5-2002-0083, established effluent limitations for chloroform; copper; diazinon; dichloromethane; 1,1-dichloroethylene; 4,4-DDT; endrin aldehyde; lindane; oil and grease; settleable matter; tetrachloroethylene (PCE); and trichloroethylene (TCE). Based on new information gathered over the term of Order No. R5-2002-0083, the discharge does not demonstrate reasonable potential to exceed the applicable water quality criteria/objective for these constituents. The removal of these effluent limitations is consistent with the anti-backsliding provisions, and the antidegradation provisions of 40 CFR 131.12 and State Water Resources Control Board Resolution 68-16. Any impact on existing water quality will be insignificant.

Order No. R5-2002-0083 contained effluent limitations for turbidity. The limitations were solely an operational check to ensure the treatment system was functioning properly and could meet the limits for total coliform organisms. The effluent limitations were not intended to regulate turbidity in the receiving water. Rather, turbidity is an operational parameter to determine proper system functioning and not a WQBEL.

This Order contains operational requirements for turbidity to be met prior to disinfection in lieu of effluent limitations. However, the operational requirements in this Order are an equivalent limitation that is not less stringent than the effluent

limitations required in the previous Order No. R5-2002-0083, and therefore does not constitute backsliding.

The proposed revised operational requirements for turbidity are the same as the effluent limitations in Order No. R5-2002-0083 (See Special Provisions VI.C.5.f. Turbidity Operational Requirements). These revisions are consistent with state regulations implementing recycled water requirements.

The revision in the turbidity limitation is consistent with the antidegradation provisions of 40 CFR 131.12 and State Water Board Resolution 68-16 because this Order imposes equivalent or more stringent requirements than Order No. R5-2002-0083 and therefore does not allow degradation.

4. Satisfaction of Antidegradation Policy

Resolution 68-16 and 40 CFR section 131.12 require the Regional Board, in regulating discharge of waste, to maintain high quality waters of the state until it is demonstrated that any change in quality will be consistent with maximum benefit to the people of the state, will not unreasonably affect beneficial uses, and will not result in water quality less than that described in the Regional Water Board's policies (e.g., quality that exceeds water quality objectives). Resolution 68-16 requires the discharge be regulated to meet best practicable treatment or control to assure that pollution or nuisance will not occur and the highest water quality consistent with the maximum benefit to the people of the state be maintained.

Policies and procedures for complying with this directive are set forth in the Basin Plan. Resolution 68-16 is applied on a case-by-case, constituent-by-constituent basis in determining whether a certain degree of degradation can be justified. It is incumbent upon the Discharger to provide technical information for the Regional Water Board to evaluate

Surface Water. With regards to surface water, the receiving water may exceed applicable water quality objectives for certain constituents as described in this Order. However, this Order and TSO Order R5-2008-0155 require the Discharger, in accordance with specified compliance schedules, to meet requirements that will result in the use of best practicable treatment or control of the discharge and will result in compliance with water quality objectives, with the exception of dissolved oxygen. This Order also establishes interim effluent limitations and compliance schedules for pollutants that cannot immediately be controlled to prevent any additional degradation of surface water by these pollutants. The total allowable discharge of 55 mgd has not been increased from the previous permit, Order No. R5-2002-0083, and therefore, does not cause additional degradation beyond that allowed in the previous permit. The discharge is consistent with Resolution 68-16 and 40 CFR section 131.12 because this Order requires the discharger to meet requirements that will result in best practicable treatment or control to assure that pollution or nuisance will not occur. Some degradation is consistent with maximum benefit to the people of the state because the discharge allows for economic or social development in the area.

Groundwater. Groundwater monitoring has been conducted around the Facility; however, additional groundwater quality monitoring results are needed. In addition, certain aspects of wastewater treatment and control practices may not be justified as representative of Best Practicable Treatment and Control (BPTC). Reasonable time is necessary to gather specific information about the Facility to make informed, appropriate, long-term decisions. This Order, therefore, establishes some groundwater limitations to assure protection of beneficial uses of groundwater (see section V.B in the Limitations and Discharge Requirements section of this Order), provisionally requires the Discharger to a corrective action plan and implementation schedule for necessary modifications (see section VI.C.2.c in the Limitations and Discharge Requirements section of this Order), and includes a reopener to consider a revision or addition of the final groundwater limitations if necessary when additional analytical monitoring results or other information are obtained. During this period, degradation may occur from certain constituents, but cannot exceed water quality objectives (or natural background water quality should it exceed objectives) or cause nuisance. For additional information see Section V.B of this Fact Sheet.

Summary of Final Effluent Limitations
Discharge Point No. 001

Table F-12. Summary of Final Effluent Limitations

Parameter	Units	Effluent Limitations				
		Average Monthly	Average Weekly	Maximum Daily	Instantaneous Minimum	Instantaneous Maximum
Aluminum, Total Recoverable	µg/L	311	200[8]	750	--	--
Ammonia Nitrogen, Total (as N)	mg/L	2	--	5	--	--
	lbs/day[2]	917	--	2294	--	--
Bis(2-ethylhexyl)phthalate	µg/L	1.8	--	3.6	--	--
Chlorodibromomethane	µg/L	5.0	--	16	--	--
Chlorine, Total Residual	µg/L	--	0.01[3]	0.02[1]	--	--
Coliform, Total[4]	MPN/100ml	--		--	--	240
Cyanide, Total Recoverable	µg/L	4.1	--	9.0	--	--
Dichlorobromomethane	µg/L	6.8	--	20	--	--
Dissolved Oxygen	mg/L	--	--	--	[7]	--
Flow	mgd	--	--	55[9]	--	--
Manganese, Total Recoverable	µg/L			286		
Molybdenum, Total Recoverable	µg/L		--	13	--	--
Nitrate plus Nitrite (as N)	mg/L	40	--	--	--	--
pH	s.u.	--	--	--	6.5	8.5
Temperature	°F	--	--	[5]	--	--
TSS[6]	mg/L	10	15	20	--	--

Parameter	Units	Effluent Limitations				
		Average Monthly	Average Weekly	Maximum Daily	Instantaneous Minimum	Instantaneous Maximum
	lbs/day[2]	4590	6885	9180	--	--
$CBOD_5$[6]	mg/L	10	15	20	--	--
	lbs/day[2]	4590	6885	9180	--	--

1 Applied as an average 1-hour limitation.
2 Mass-based effluent limitations are established using the following formula:
Mass (lbs/day) = flow rate (mgd) x 8.34 x effluent limitation (mg/L)
where: Mass = mass limitation for a pollutant (lbs/day)
Effluent limitation = concentration limit for a pollutant (mg/L)
Flow rate = average dry weather flow (55 mgd)
3 Applied as a 4-day average limitation.
4 Effluent total coliform also shall not exceed i.) 2.2 MPN/100ml, as a 7-day median; and ii). 23 MPN/100ml, more than once in any 30-day period.
5 The maximum effluent temperature shall not exceed the natural receiving water temperature by more than 20°F.
6 In addition to concentration-based effluent limitations, the arithmetic mean of TSS or $CBOD_5$ in effluent samples collected over a monthly period shall not exceed 15 percent of the arithmetic mean of the values for influent samples collected at approximately the same time during the same period (85 percent removal).
7 The Discharger shall maintain a minimum daily average effluent DO concentration of 6.0 mg/L from 1 September through 30 November and 5.0 mg/L from 1 December through 31 August.
8 Annual Average
9 Average Dry Weather Flow

E. Interim Effluent Limitations

1. **Mercury.** See Section IV.C.3.s. for the rationale for the interim effluent limitations for mercury

F. Land Discharge Specifications

[Not Applicable]

G. Reclamation Specifications

For Order No. R5-2002-0083, the Discharger had requested to be allowed to supply chlorinated secondary treated wastewater for specific reclamation uses, including limited on-site uses such as dust control and compaction by building contractors, street sweeping, and landscape irrigation, in addition to wastewater being used to irrigate 16 acres of agricultural land adjacent to the Facility, which is regulated by WDR Order No. 95-183.

Reclaimed water is required to meet the criteria contained in Title 22, Division 4, CCR (section 60301, et seq.). This Order retains the reclamation requirements contained in the previous Order *to reduce public health concerns and comply with the requirements of Title 22 California Code of Regulations.*

Treated wastewater discharged for reclamation purposes not specified in this Order must be approved by the Executive Officer, or regulated under separate waste discharge requirements, and must meet the requirements of CCR, Title 22.

V. RATIONALE FOR RECEIVING WATER LIMITATIONS

Basin Plan water quality objectives to protect the beneficial uses of surface water and groundwater include numeric objectives and narrative objectives, including objectives for chemical constituents, toxicity, and tastes and odors. The toxicity objective requires that surface water and groundwater be maintained free of toxic substances in concentrations that produce detrimental physiological responses in humans, plants, animals, or aquatic life. The chemical constituent objective requires that surface water and groundwater shall not contain chemical constituents in concentrations that adversely affect any beneficial use or that exceed the maximum contaminant levels (MCLs) in Title 22, CCR. The tastes and odors objective states that surface water and groundwater shall not contain taste- or odor-producing substances in concentrations that cause nuisance or adversely affect beneficial uses. The Basin Plan requires the application of the most stringent objective necessary to ensure that surface water and groundwater do not contain chemical constituents, toxic substances, radionuclides, or taste and odor producing substances in concentrations that adversely affect domestic drinking water supply, agricultural supply, or any other beneficial use.

A. Surface Water

1. CWA sections 303(a-c), requires states to adopt water quality standards, including criteria where they are necessary to protect beneficial uses. The Regional Water Board adopted water quality criteria as water quality objectives in the Basin Plan. The Basin Plan states that "*[t]he numerical and narrative water quality objectives define the least stringent standards that the Regional Water Board will apply to regional waters in order to protect the beneficial uses.*" The Basin Plan includes numeric and narrative water quality objectives for various beneficial uses and water bodies. This Order contains Receiving Surface Water Limitations based on the Basin Plan numerical and narrative water quality objectives for bacteria, biostimulatory substances, color, chemical constituents, dissolved oxygen, floating material, oil and grease, pH, pesticides, radioactivity, suspended sediment, settleable substances, suspended material, tastes and odors, temperature, toxicity, and turbidity.

   Numeric Basin Plan objectives for bacteria, dissolved oxygen, pH, temperature, and turbidity are applicable to this discharge and have been incorporated as Receiving Surface Water Limitations. Rationale for these numeric receiving surface water limitations are as follows:

   a. **Bacteria.** The Basin Plan includes a water quality objective that "*[I]n water designated for contact recreation (REC-1), the fecal coliform concentration based on a minimum of not less than five samples for any 30-day period shall not exceed a geometric mean of 200/100 mL, nor shall more than ten percent of the total number of samples taken during any 30-day period exceed 400/100 mL.*" Numeric Receiving Water Limitations for bacteria are included in this Order and are based on the Basin Plan objective.

b. **Biostimulatory Substances**. The Basin Plan includes a water quality objective that "*[W]ater shall not contain biostimulatory substances which promote aquatic growths in concentrations that cause nuisance or adversely affect beneficial uses.*" Receiving Water Limitations for biostimulatory substances are included in this Order and are based on the Basin Plan objective.

c. **Chemical Constituents**. The Basin Plan includes a water quality objective that *"[W]aters shall not contain chemical constituents in concentrations that adversely affect beneficial uses."* Receiving Water Limitations for chemical constituents are included in this Order and are based on the Basin Plan objective.

d. **Color**. The Basin Plan includes a water quality objective that "*[W]ater shall be free of discoloration that causes nuisance or adversely affects beneficial uses.*" Receiving Water Limitations for color are included in this Order and are based on the Basin Plan objective.

e. **Dissolved Oxygen.** The Basin Plan includes a water quality objective that "*[W]ithin the legal boundaries of the Delta, the dissolved oxygen concentrations shall not be reduced below: 7.0 mg/L in the Sacramento River (below the I Street Bridge) and in all Delta waters west of the Antioch Bridge; 6.0 mg/L in the San Joaquin River (between Turner Cut and Stockton, 1 September through 30 November); and 5.0 mg/L in all other Delta waters except those bodies of water which are constructed for special purposes and from which fish have been excluded or where the fishery is not important as a beneficial use.*" Numeric Receiving Water Limitations for dissolved oxygen are included in this Order and are based on the Basin Plan objective.

f. **Floating Material**. The Basin Plan includes a water quality objective that *"[W]ater shall not contain floating material in amounts that cause nuisance or adversely affect beneficial uses."* Receiving Water Limitations for floating material are included in this Order and are based on the Basin Plan objective.

g. **Oil and Grease**. The Basin Plan includes a water quality objective that *"[W]aters shall not contain oils, greases, waxes, or other materials in concentrations that cause nuisance, result in a visible film or coating on the surface of the water or on objects in the water, or otherwise adversely affect beneficial uses."* Receiving Water Limitations for oil and grease are included in this Order and are based on the Basin Plan objective.

h. **pH.** The Basin Plan includes water quality objective that *"[T]he pH shall not be depressed below 6.5 nor raised above 8.5. Changes in normal ambient pH levels shall not exceed 0.5 in fresh waters with designated COLD or WARM beneficial uses*" This Order includes receiving water limitations for both pH range and pH change and are based on the Basin Plan objective.

The Basin Plan allows an appropriate averaging period for pH change in the receiving stream. Since there is no technical information available that indicates that aquatic organisms are adversely affected by shifts in pH within the 6.5 to 8.5 range, an averaging period is considered appropriate and a monthly averaging

period for determining compliance with the 0.5 receiving water pH limitation is included in this Order.

i. **Pesticides**. The Basin Plan includes a water quality objective for pesticides beginning on page III-6.00. Receiving Water Limitations for pesticides are included in this Order and are based on the Basin Plan objective.

j. **Radioactivity**. The Basin Plan includes a water quality objective that *"[R]adionuclides shall not be present in concentrations that are harmful to human, plant, animal or aquatic life nor that result in the accumulation of radionuclides in the food web to an extent that presents a hazard to human, plant, animal or aquatic life."* The Basin Plan states further that *"[A]t a minimum, waters designated for use as domestic or municipal supply (MUN) shall not contain concentrations of radionuclides in excess of the maximum contaminant levels (MCLs) specified in Table 4* [currently referred to as Table 64443] *(MCL Radioactivity) of Section 64443 of Title 22 of the California Code of Regulations..."* Receiving Water Limitations for radioactivity are included in this Order and are based on the Basin Plan objective.

k. **Suspended Sediments.** The Basin Plan includes a water quality objective that *"[T]he suspended sediment load and suspended sediment discharge rate of surface waters shall not be altered in such a manner as to cause nuisance or adversely affect beneficial uses"* Receiving Water Limitations for suspended sediments are included in this Order and are based on the Basin Plan objective.

l. **Settleable Substances.** The Basin Plan includes a water quality objective that *"[W]aters shall not contain substances in concentrations that result in the deposition of material that causes nuisance or adversely affects beneficial uses."* Receiving Water Limitations for settleable substances are included in this Order and are based on the Basin Plan objective.

m. **Suspended Material.** The Basin Plan includes a water quality objective that *"[W]aters shall not contain suspended material in concentrations that cause nuisance or adversely affect beneficial uses."* Receiving Water Limitations for suspended material are included in this Order and are based on the Basin Plan objective.

n. **Taste and Odors**. The Basin Plan includes a water quality objective that *"[W]ater shall not contain taste- or odor-producing substances in concentrations that impart undesirable tastes or odors to domestic or municipal water supplies or to fish flesh or other edible products of aquatic origin, or that cause nuisance, or otherwise adversely affect beneficial uses."* Receiving Water Limitations for taste- or odor-producing substances are included in this Order and are based on the Basin Plan objective.

o. **Temperature.** The Thermal Plan is applicable to this discharge. The thermal Plan requires that the discharge shall not cause the following in San Joaquin River:

i. *"The creation of a zone, defined by water temperatures of more than 1°F above natural receiving water temperature, which exceeds 25 percent of the cross-sectional area of the river channel at any point.*

ii. *A surface water temperature rise greater than 4°F above the natural temperature of the receiving water at any time or place."*

Numeric receiving Water Limitations for temperature are included in this Order and are based on the Thermal Plan requirements.

p. **Toxicity**. The Basin Plan includes a water quality objective that *"[A]ll waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life."* Receiving Water Limitations for toxicity are included in this Order and are based on the Basin Plan objective.

q. **Turbidity.** The Basin Plan includes a water quality objective that "*[I]ncreases in turbidity attributable to controllable water quality factors shall not exceed the following limits:*

- *Where natural turbidity is between 0 and 5 Nephelometric Turbidity Units (NTUs), increases shall not exceed 1 NTU.*
- *Where natural turbidity is between 5 and 50 NTUs, increases shall not exceed 20 percent.*
- *Where natural turbidity is between 50 and 100 NTUs, increases shall not exceed 10 NTUs.*
- *Where natural turbidity is greater than 100 NTUs, increases shall not exceed 10 percent.*"

A numeric Receiving Surface Water Limitation for turbidity is included in this Order and is based on the Basin Plan objective for turbidity.

B. Groundwater

1. **Basin Plan, Beneficial Uses, and Regulatory Considerations.** The beneficial uses of the underlying ground water are municipal and domestic supply, industrial service supply, industrial process supply, and agricultural supply.

   Basin Plan water quality objectives for groundwater include narrative objectives for toxicity, chemical constituents, and tastes and odors. The toxicity objective requires that groundwater be maintained free of toxic substances in concentrations that produce detrimental physiological responses in humans, plants, animals, or aquatic life. The chemical constituent objective states groundwater shall not contain chemical constituents in concentrations that adversely affect any beneficial use. The tastes and odors objective prohibits taste- or odor-producing substances in concentrations that cause nuisance or adversely affect beneficial uses. The Basin Plan also establishes numerical water quality objectives for bacteria, chemical

constituents, and radioactivity in groundwater designated as municipal supply; these include, at a minimum, compliance with MCLs in Title 22 of the CCR. Additionally, the bacteria objective prohibits coliform organisms at or above 2.2 MPN/100 mL.

The Basin Plan requires the application of the most stringent objective necessary to ensure that waters do not contain chemical constituents, toxic substances, radionuclides, taste- or odor-producing substances, or bacteria in concentrations that adversely affect municipal or domestic supply, agricultural supply, industrial supply or some other beneficial use.

2. **Antidegradation.** The antidegradation directives of State Water Board Resolution No. 68-16, "Statement of Policy With Respect to Maintaining High Quality Waters in California," or "Antidegradation Policy" require that waters of the State that are better in quality than established water quality objectives be maintained "*consistent with the maximum benefit to the people of the State.*" Some degradation of the groundwater for certain constituents is consistent with maximum benefit to the people of California because the technology, energy, and waste management advantages of municipal water treatment plants far outweigh the environmental impact of a community that would otherwise be reliant on numerous domestic wells. Economic prosperity of local communities is of maximum benefit to the people of California, and therefore, sufficient reason to accommodate this wastewater discharge provided terms of reasonable degradation are defined and met.

3. **Wastewater Storage.** The Discharger utilizes an unlined sludge lagoon located within the secondary treatment facility on the east side of the San Joaquin River, and three unlined facultative oxidation ponds located on the west side of the San Joaquin River that store treated domestic waster before the tertiary treatment process. Domestic wastewater contains constituents of concern such as total dissolved solids (TDS), specific conductivity (EC), pathogens, nitrates, organics, metals, and oxygen demanding substances (BOD).

   Within the eastern portion of the Facility, digested "*sludge is pumped to a sludge lagoon where it is allowed to concentrate. A dredge is used to pump settled and concentrated material off the bottom of the lagoon. . .*" (ROWD, September 2006) Within the western portion of the Facility, "*Effluent is introduced into a recirculation canal at the northeast corner of Pond #1 [located adjacent to the San Joaquin River], from where it flows south and then west around the perimeter of Ponds #1-3. Control gates along the recirculation canal are opened or closed as needed to introduce effluent to the south end of the facultative ponds. Similar flow control gates are located at a lower elevation along the northern edge of the facultative ponds and allow pond water into a recirculation canal parallel to the facultative pond's northern edges. . . .A perimeter groundwater interceptor drainage ditch is located outside the recirculation canal south of the facultative ponds and a subsurface interceptor drain is located west of the recirculation canal west of Pond #3.*" From the interceptor ditch, "*captured groundwater is pumped back to the recirculation canal. . . Water from the facultative ponds entering the north recirculation canal can be directed via pipeline northward to another recirculation canal that delivers water to the west end of the engineered wetlands.*" (Condor Earth Technologies, Inc. 22 September 2006)

Treated domestic sewage in the unlined lagoon, recirculation canals, or facultative ponds, may result in an increase in the concentration of constituents of concern in groundwater, and therefore, the previous Order No. R5-2002-0083 required the Discharger to design and construct a network of groundwater monitoring wells that includes "*one or more background monitoring wells and a sufficient number of designated monitoring wells to evaluate performance of best practicable control technology (BPCT) measures and to determine if the discharge has degraded groundwater.*"

4. **Groundwater Quality.** By 17 December 2003, the Discharger installed fourteen monitoring wells (MW1 – MW14), and to identify background groundwater quality, two additional monitoring wells were installed (MW15 and MW16). Surface water samples were also obtained from the San Joaquin River near (1) Garwood Bridge, (2) the intersection of San Joaquin River and Burns Cutoff, (3) Pond No. 2, (4) the Agricultural Ditch West of Pond #3, and (5) Pump Station near Oxidation Pond #1. In 2005, two additional monitoring wells were installed, MW-17 and MW-18. MW-17 was installed down gradient (east) of MW-13, which contained nitrate concentrations that exceed the MCL. MW-18 was installed outboard of the recirculation canal to relocate MW-4, which may have been influenced by, or directly hydraulically connected to, the recirculation canal and therefore may not be representative of groundwater conditions (Geotechnical Consultants, Inc. 2004, Condor Earth Technologies, Inc. 2006). The secondary-level treated effluent discharged through the recirculation canal and stored in the facultative ponds was not monitored.

   Quarterly samples of electrical conductivity (EC), total dissolved solids (TDS), ammonia, nitrate as nitrogen, Total Kjeldahl Nitrogen (TKN), and total coliform were collected. Water quality as indicated by the analytical results shows high levels of EC and TDS in monitoring wells MW-1, MW-2, MW-3, MW-4, MW-5, MW-6, MW-7, MW-12, MW-13, MW-17, and MW-18. Analytical results also show high levels of nitrate in monitoring wells MW-10 and MW-13, and high levels of total coliform in monitoring wells MW-7, MW-8, MW-9, MW-13, and MW-17. Table F-13 below summarizes the range of the data from the period of December 2004 through June 2006 for some monitoring wells.

   Monitoring well MW-4 is located between the recirculation canal and the groundwater interceptor drain, and therefore, may not represent groundwater conditions. Monitoring wells MW-8, MW-9, MW-11, and MW-14 are located close to the San Joaquin River and reflect the influence of fresh water recharge from the river, and therefore, also may not represent groundwater conditions. MW-1, MW-2, and MW-10 are also located along the western side of the San Joaquin River. However, MW-1 and MW-2, located on the eastern side of Pond #1 and along the recirculation canal, contain higher EC and TDS levels than the San Joaquin River, which suggests that these wells may be hydraulically and chemically influenced by Pond #1 or the recirculation canal. No known samples were obtained from Pond #1 nor the secondary effluent to conclude differently, and the single sample obtained from Pond #2, which contained EC and TDS concentrations at 1100 and 600 mg/L, respectively, is insufficient data to make informed, appropriate determinations. MW-10, located near an effluent canal, contains high levels of nitrate, which

suggests that it may be hydraulically and chemically influenced by the effluent. (Geotechnical Consultants, Inc. 2004, Condor Earth Technologies, Inc. 2006)

Table F-13. Summary of Groundwater Conditions

Parameter	Water Quality Objectives	Background Monitoring Wells		Groundwater Monitoring Wells Near Ponds						Monitoring Wells at Secondary Facility		
				Between Ponds & SJR		South of Ponds		West of Ponds		Sludge Lagoon	East of Clarifiers	
		MW-15	MW-16	MW-1	MW-2	MW-3	MW-5	MW-6	MW-7	MW-12	MW-13	MW-17
EC (umhos/cm)	700[2]	1012 - 1662	1056 - 1922	1478 - 2886	1544 - 2869	1750 - 1800	1830 - 2492	1197 - 1940	1462 - 2233	1211 - 2305	1640 - 2976	1293 - 2322
	900, 1600, 2200[3]											
TDS (mg/L)	450[2]	870 - 1170	1170 - 1220	1440 - 1510	1430 - 1570	990 - 1040	1490 - 1570	1130 - 1250	1200 - 1290	1020 - 1420	1670 - 2050	1430 - 1730
	500, 1000, 1500[3]											
Ammonia as N	1.5	-0.2 to 10.6	-0.2 to 0.3	-0.2 to 3.8	-0.2 to 0.6	-0.2 to 0.7	-0.2 to 0.4	-0.2 to 0.3	-0.2 to 0.4	-0.2 to 2.2	-0.2 to 1.5	-0.2 to 0.2
Nitrate as N (mg/L)	10[1]	-0.1 to 22.2	-0.1	-0.1 to 0.2	-1	-0.1	-0.1 to 1.2	-0.1	-0.1	-0.1	0.6 to 38.6	1.1 to 7.5
TKN	--	-0.5	<0.5	0.5	0.6	-0.5	1.1	0.5	-0.5	6	-0.5	0.6
Total Coliform (MPN/100 mL)	<2.2[4]	23 - 7000	-2 to 80	-2 to 70	-2 to 13	-2 to 50	-2 to 23	-2 to 80	-2 to 11100	-2 to 3.6	-2 to 24000	-2 to 80

1. USEPA Drinking Water Standards (Primary Maximum Contaminant Level)
2. Agricultural water quality goals based on *Water Quality for Agriculture*, Food and Agriculture Organization of the United Nations—Irrigation and Drainage Paper No. 29, Rev. 1 (R.S. Ayers and D.W. Westcot, Rome, 1985) Agricultural water quality goals listed provide no restrictions on crop type or irrigation methods for maximum crop yield. Higher concentrations may require special irrigation methods to maintain crop yields or may restrict types of crops grown.
3. Department of Public Health Secondary MCLs. The secondary MCLs are stated as a recommended level, upper level, and a short-term maximum level.
4. Basin Plan water quality objective for MUN beneficial use.

5. **Background Conditions.** The Facility is located in the San Joaquin Delta, and the Facility is bifurcated by the San Joaquin River. In general, areas of poor water quality with high salinity exist throughout the Delta subbasin. TDS values range from 210 to 7800 mg/L and average about 1190 mg/L. Areas of elevated chloride and nitrate occur in several areas within the subbasin. (California's Groundwater, Bulletin 118, 20 January 2006) Monitoring results obtained along this segment of the San Joaquin River indicate an average TDS value of about 400 mg/L, which is significantly lower than the subbasin levels. Land use to the west of the Facility is predominately agricultural, and land use to the east of the Facility is mixed uses of agricultural and municipal supply water. "*Groundwater flow occurs primarily through fine-grained sand and silty sand channel deposits found as laterally discontinuous lenses and stingers set within clays. The approximate depth of the silty channel deposits is on the order of 150 feet. The upper aquifer has poor transmissivity and low storage.*" (Geotechnical Consultants, Inc. 2004)

   By definition background groundwater conditions are those pollutants that are present in the groundwater that are not attributable to the Facility's activities. Rather, these conditions are outside the influence of the Facility, and may be caused by local geophysical, hydrological, and meteorological process, and wildlife and

outside anthropogenic activities. The Discharger installed two background monitoring wells, MW-15 and MW-16. "*Background well MW-15 is located 1700 feet upgradient of the ponds to the south, and background well MW-16 is located 2500 feet downgradient of the ponds to the west. . . MW-15 is a true background well, uninfluenced by the presence of the ponds.*" (Condor Earth Technologies, Inc. September 2006) These background monitoring wells are located on the western side of the San Joaquin River. Previous Table F-13 summarizes the range of data obtained in the background monitoring wells MW-15 and MW-16, which, at times, exceed water quality objectives. No known background monitoring well was installed on the eastern side of the San Joaquin River.

The Basin Plan stipulates that when the background condition(s) is less stringent than the numeric water quality objective, the background condition supercedes the numeric water quality objective. Therefore establishing the numeric level at which constituents of concern are present in the groundwater with no influence from the Facility is relevant in determining if the discharge degrades groundwater and in evaluating the performance of the Facility's BPCT measures. Since anthropogenic activities do not affect all aspects of water quality, it is possible that background water quality conditions can exist for one constituent but not for another, and therefore, generalizations about the subbasin water quality conditions may not adequately protect the beneficial uses. For instance, the high levels of EC and TDS at MW-1 and MW-2 and the high levels of nitrates in MW-10 and MW-13 indicate possible localized impacts. The Discharger's groundwater condition study states "*the geology creates a situation where there is considerable variability and poor interconnection between groundwater at different places.*" (Condor Earth Technologies, Inc. September 2006)

6. **Groundwater Limits.** In allowing a discharge, the Regional Water Board must comply with CWC Section 13263 in setting appropriate conditions. The Regional Water Board is required, relative to the groundwater that may be affected by the discharge, to implement the Basin Plan and consider the beneficial uses to be protected along with the water quality objectives essential for that purpose. The Regional Water Board need not authorize the full utilization of the waste assimilation capacity of the groundwater (CWC 13263(b)) and must consider other waste discharges and factors that affect that capacity.

   TDS and EC concentrations in nearly all wells, including at times the background wells, exceed water quality objectives. However, high TDS and EC concentration values in localized areas such as monitoring wells MW-1 and MW-2 located between Pond #1 and the San Joaquin River on the western portion of the Facility, indicate that the treated domestic wastewater may be impacting groundwater. Further indications that MW-1 and MW-2 may be locally impacted comes from a hydrograph study finding that states "there is a net hydrostatic pressure gradient towards the river from the ponds." (Condor Earth Technologies, Inc. September 2006) Also, nitrate concentration values in MW-10 located near the San Joaquin River and the effluent discharge on the western portion of the Facility indicate that certain wastewater control practices may not be justified as representative of Best Practicable Treatment and Control (BPTC). On the eastern portion of the Facility,

high TDS and EC concentrations in MW-12, MW-13 and MW-17 and high nitrate concentrations in MW-13 and MW-17 indicate that certain aspects of wastewater treatment and control practices also may not be justified as representative of BPTC, or certain operation and maintenance practices may not be justified as best management practices. Still, insufficient data has been reported to establish background groundwater conditions, even though it appears that groundwater in the aquifer beneath the Facility may be impacted for beneficial uses. Though groundwater monitoring has been conducted around the Facility, additional background groundwater quality data are needed to establish the most appropriate groundwater limits. Reasonable time is necessary to gather specific information about the Facility to make informed, appropriate, long-term decisions.

Therefore, this Order provisionally requires the Discharger to install additional monitoring wells and any other testing needed to effectively and fully characterize background quality conditions. Based on this information, the Discharger must technically evaluate the Facility's processes or storage areas and submit a time schedule to implement or modify BPTCs as necessary. This Order also contains narrative and numeric groundwater limitations that become effective upon completion of the background quality condition and BPTC evaluation studies. This Order contains a reopener to add or modify groundwater limitations as necessary.

In addition, this Order requires the continued monitoring of the groundwater monitoring network to monitor the impact of the discharge and help develop long-term groundwater limits. This Order also requires monitoring of the secondary effluent transported to the facultative ponds to measure concentrations of certain constituents contained in the treated domestic wastewater, and of the pond water to determine whether degradation of the groundwater for certain constituents from percolation of the treated domestic wastewater stored in the unlined facultative ponds is consistent with maximum benefit to the people of California, and thus, complies with Antidegradation Policy.

VI. RATIONALE FOR MONITORING AND REPORTING REQUIREMENTS

Section 122.48 requires that all NPDES permits specify requirements for recording and reporting monitoring results. Water Code sections 13267 and 13383 authorizes the Regional Water Board to require technical and monitoring reports. The Monitoring and Reporting Program (MRP), Attachment E of this Order, establishes monitoring and reporting requirements to implement federal and state requirements. The following provides the rationale for the monitoring and reporting requirements contained in the MRP for this facility.

A. Influent Monitoring

1. Influent monitoring is required to collect data on the characteristics of the wastewater and to assess compliance with effluent limitations (e.g., BOD_5 and TSS reduction requirements). Influent monitoring requirements for flow, pH, CBOD5, TSS, EC, and TDS are retained from previous Order No. R5-2002-0083.

B. Effluent Monitoring

1. Pursuant to the requirements of 40 CFR §122.44(i)(2) effluent monitoring is required for all constituents with effluent limitations. Effluent monitoring is necessary to assess compliance with effluent limitations, assess the effectiveness of the treatment process, and to assess the impacts of the discharge on the receiving stream. Because the effluent data submitted by the Discharger did not demonstrate reasonable potential for barium, chromium VI, chloroform, copper, DDT, dichloromethane, endrin aldehyde, lead, lindane, TCE, PCE, or 1,1-dichloroethylene, specific effluent monitoring requirements for these parameters were removed. These parameters will continue to be monitored annually as part of the priority pollutant monitoring. Effluent monitoring requirements from the previous order for the remaining parameters are carried over to assess compliance with effluent limitations. Monitoring requirements for aluminum, dissolved oxygen, and manganese are established or modified from the previous order to assess compliance with newly established effluent limitations. Monitoring requirements for methyl-mercury, sulfur dioxide, and sodium biosulfate have been added to assess the impacts of the discharge on the receiving stream. A special study requires monitoring of priority pollutants (Provision VI.C.2.d) to assess reasonable potential to exceed water quality criteria for these parameters.

C. Whole Effluent Toxicity Testing Requirements

1. **Acute Toxicity.** Consistent with the requirements contained in previous Order No. R5-2002-0083, weekly 96-hour bioassay testing is required to demonstrate compliance with the effluent limitation for acute toxicity.

2. **Chronic Toxicity.** Chronic whole effluent toxicity testing has been retained from previous Order No. R5-2002-0083 to demonstrate compliance with the Basin Plan's narrative toxicity objective.

D. Receiving Water Monitoring

1. Surface Water Monitoring and Visual Observations

a. Receiving water monitoring and visual observations are necessary to assess compliance with receiving water limitations and to assess the impacts of the discharge on the receiving stream to assess reasonable potential to exceed water quality criteria for these parameters. Receiving water monitoring is carried over from the previous Order.

2. Groundwater Monitoring

a. Section 13267 of the California Water Code states, in part, *"(a) A Regional Water Board, in establishing…waste discharge requirements… may investigate the quality of any waters of the state within its region"* and *"(b) (1) In conducting an investigation…, the Regional Water Board may require that any person who…*

discharges… waste…that could affect the quality of waters within its region shall furnish, under penalty of perjury, technical or monitoring program reports which the Regional Water Board requires. The burden, including costs, of these reports shall bear a reasonable relationship to the need for the report and the benefits to be obtained from the reports." In requiring those reports, the Regional Water Board shall provide the person with a written explanation with regard to the need for the reports, and shall identify the evidence that supports requiring that person to provide the reports. The Monitoring and Reporting Program (Attachment E) is issued pursuant to California Water Code Section 13267. The groundwater monitoring and reporting program required by this Order and the Monitoring and Reporting Program are necessary to assure compliance with these waste discharge requirements. The Discharger is responsible for the discharges of waste at the Facility subject to this Order.

b. This Order requires the Discharger to continue groundwater monitoring as established under previous Order No. R5-2002-0083 and includes a regular schedule of groundwater monitoring in the attached Monitoring and Reporting Program. The groundwater monitoring reports are necessary to evaluate impacts to waters of the State to assure protection of beneficial uses and compliance with Regional Water Board plans and policies, including Resolution No. 68-16. Evidence in the record includes effluent monitoring data that indicates the presence of constituents that may degrade groundwater and surface water. For additional information see previous Section V.B of this Fact Sheet.

E. Other Monitoring Requirements

1. **Reclamation Monitoring**
   Reclamation monitoring is required to ensure compliance with Effluent Limitations and Discharge Specifications IV.C. in the Limitations and Discharge Requirements section of this Order.

2. **Biosolids Monitoring**
   Biosolids monitoring is required to ensure compliance with the biosolids disposal requirements (Special Provisions VI.C.5.b, c, and d). Biosolids disposal requirements are imposed pursuant to 40 CFR Part 503 to protect public health and prevent groundwater degradation.

3. **Water Supply Monitoring**
   Water supply monitoring is required to evaluate the source of constituents in the wastewater.

4. **Monitoring of Secondary Effluent and Facultative Ponds**
   Monitoring of the secondary effluent and the wastewater in the facultative ponds are necessary to assess the impacts of the percolate to groundwater. Secondary effluent and pond monitoring are new requirements in this Order because the localized background groundwater conditions have not been determined, which is necessary to ensure compliance with the Groundwater Limitations V.B in the

Limitations and Discharge Requirements section of this Order. For additional information see sections V.B. and VII.B.2.c. of this Fact Sheet.

VII. RATIONALE FOR PROVISIONS

A. Standard Provisions

Standard Provisions, which apply to all NPDES permits in accordance with section 122.41, and additional conditions applicable to specified categories of permits in accordance with section 122.42, are provided in Attachment D. The discharger must comply with all standard provisions and with those additional conditions that are applicable under section 122.42.

Section 122.41(a)(1) and (b) through (n) establish conditions that apply to all State-issued NPDES permits. These conditions must be incorporated into the permits either expressly or by reference. If incorporated by reference, a specific citation to the regulations must be included in the Order. Section 123.25(a)(12) allows the state to omit or modify conditions to impose more stringent requirements. In accordance with section 123.25, this Order omits federal conditions that address enforcement authority specified in sections 122.41(j)(5) and (k)(2) because the enforcement authority under the Water Code is more stringent. In lieu of these conditions, this Order incorporates by reference Water Code section 13387(e).

B. Special Provisions

1. Reopener Provisions

a. **Special Provisions VI.C.1.a. & b.** These provisions are based on CFR Part 123 and allow future modification of this Order and its effluent limitations as necessary in response to updated WQOs that may be established in the future.

b. **Mercury, Total.** This provision allows the Regional Water Board to reopen this Order in the event a mercury TMDL program is adopted. In addition, this Order shall be reopened if the Regional Water Board determines that a mercury offset program is feasible for dischargers subject to a NPDES permits.

c. **Pollution Prevention.** This Order requires the Discharger to update and implement the salinity and mercury pollution prevention plans (PPP) following CWC section 13263.3(d)(3). This reopener provision allows the Regional Water Board to reopen this Order for addition and/or modification of effluent limitations and requirements for these constituents based on a review of the pollution prevention plans and success in the implementation of these plans.

d. **Whole Effluent Toxicity.** This Order requires the Discharger to investigate the causes of, and identify corrective actions to reduce or eliminate effluent toxicity through a Toxicity Reduction Evaluation (TRE). This Order may be reopened to include a numeric chronic toxicity limitation, a new acute toxicity limitation, and/or

a limitation for a specific toxicant identified in the TRE. Additionally, if a numeric chronic toxicity water quality objective is adopted by the State Water Board, this Order may be reopened to include a numeric chronic toxicity limitation based on that objective.

e. **Water Effects Ratio (WER) and Metal Translators.** A default WER of 1.0 has been used in this Order for calculating CTR criteria and Basin Plan objectives for ammonia or applicable priority pollutant inorganic constituents. If the Discharger performs defensible water effect ratio studies to determine site-specific WERs and/or site-specific dissolved-to-total metal translators, this Order may be reopened to modify the effluent limitations for applicable constituents. Accordingly, this provision allows the Regional Water Board to reopen this Order to modify the applicable effluent limitations in the event that the Discharger conducts and completes these studies, or based upon an independent scientific peer review's defensible findings that update the national ambient water quality criteria for aluminum.

f. **Best Practicable Treatment or Control Assessment.** This Order requires the Discharger to complete and submit a correction action plan and implementation schedule for necessary modifications to any of the Facility's storage, treatment, or disposal components where the groundwater monitoring results exceed either the background monitoring results or the appropriate numeric groundwater water quality objectives that are adequately protective of the beneficial uses. This reopener provision allows the Regional Water Board to reopen this Order for addition and/or modification of the groundwater limitations and requirements based on this report and the site-specific objectives for protection of the beneficial uses.

g. **Central Valley Drinking Water Policy (Special Provisions VI.C.1.i.)**. The Regional Water Board is currently working with stakeholders to develop a Drinking Water Policy for the Central Valley. Based on the current schedule, the Basin Plan may be proposed to be amended in 2009 or 2010 to incorporate water quality objectives for the protection of drinking water supplies. A reopener has been included in the Order to allow the Regional Water Board to reopen the permit to include appropriate effluent limitations, as appropriate, to require compliance with these objectives.

h. **Ammonia Studies.** The Regional Water Board contracted with researchers at the University of California, Davis Aquatic Toxicology Laboratory to initiate studies to evaluate the potential effects of ammonia on delta smelt. This reopener provision allows the Regional Water Board to reopen this Order for addition and/or modification of the ammonia limitations and requirements based on this report or based upon other defensible scientific findings.

i. **Regional Monitoring Program.** The State and Regional Water Boards are committed to creation of a coordinated Regional Monitoring Program to address receiving water monitoring in the Delta for all Water Board regulatory and research programs. This reopener provision allows the Regional Water Board to

reopen this Order to make appropriate adjustments in permit-specific monitoring to coordinate with the Regional Monitoring Program.

i. **The Bay-Delta Plan**. The South Delta salinity standards are currently under review by the State Water Board in accordance with implementation provisions contained in the Bay-Delta Water Quality Control Plan. This review in process includes an updated independent scientific investigation of irrigation salinity needs in the southern Delta. A reopener has been included in the Order to allow the Regional Water Board to reopen the permit to include appropriate effluent limitations, as appropriate, to require compliance with these objectives.

2. Special Studies, Technical Reports, and Additional Monitoring Requirements

a. **Chronic Whole Effluent Toxicity Requirements.** The Basin Plan contains a narrative toxicity objective that states, "*All waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life.*" (Basin Plan at III-8.00.) To comply with Provision G.12 in the previous permit, Order No. R5-2002-0083, the Discharger submitted a TRE/TIE Work Plan, dated 26 July 2002. On 27 March 2003, Regional Water Board staff provided comments regarding the TIE/TRE Work Plan and the Discharger's subsequent Technical Memorandum dated 11 December 2002, and requested the Discharger to update the TIE/TRE Work Plan accordingly. Subsequently, the Discharger submitted the revised TIE/TRE Work Plan on 10 December 2003, and the Executive Officer conditionally approved the work plan on 4 May 2004.

In April 2007, the Discharger concluded the TRE, and submitted the evaluation report to the Regional Water Board, *Assessment of the City of Stockton's Historic Whole Effluent Toxicity Testing and Toxicity Reduction Evaluation Programs for Selenastrum capriconutum*, Jones & Stockes Associates. The TRE identified the toxicant in the *Selenastrum capriconutum* bioassay as ammonia. Recent Facility upgrades that included new nitrification facilities were expected to reduce the occurrence of the toxicant ammonia. Subsequent accelerated monitoring concluded in October 2007 without further *Selenastrum capricornutum* (algae) toxicity, and, therefore, confirmed the TRE findings.

This provision requires the Discharger to update its TRE Work Plan in accordance with USEPA guidance. In addition, the provision provides a numeric toxicity monitoring trigger and requirements for accelerated monitoring, as well as, requirements for TRE initiation if a pattern of toxicity has been demonstrated.

Monitoring Trigger. A numeric toxicity monitoring trigger of > 1 TUc (where TUc = 100/NOEC) is applied in the provision, because this Order does not allow any dilution for the chronic condition. Therefore, a TRE is triggered when the effluent exhibits a pattern of toxicity at 100% effluent.

Accelerated Monitoring. The provision requires accelerated WET testing when a regular WET test result exceeds the monitoring trigger. The purpose of accelerated monitoring is to determine, in an expedient manner, whether there is a pattern of toxicity before requiring the implementation of a TRE. Due to possible seasonality of the toxicity, the accelerated monitoring should be performed in a timely manner, preferably taking no more than 2 to 3 months to complete.

The provision requires accelerated monitoring consisting of four chronic toxicity tests every 2 weeks using the species that exhibited toxicity. Guidance regarding accelerated monitoring and TRE initiation is provided in the *Technical Support Document for Water Quality-based Toxics Control, EPA/505/2-90-001, March 1991* (TSD). The TSD at page 118 states, "EPA recommends if toxicity is repeatedly or periodically present at levels above effluent limits more than 20 percent of the time, a TRE should be required." Therefore, four accelerated monitoring tests are required in this provision. If no toxicity is demonstrated in the four accelerated tests, then it demonstrates that toxicity is not present at levels above the monitoring trigger more than 20 percent of the time (only 1 of 5 tests are toxic, including the initial test). However, notwithstanding the accelerated monitoring results, if there is adequate evidence of a pattern of effluent toxicity (i.e. toxicity present exceeding the monitoring trigger more than 20 percent of the time), the Executive Officer may require that the Discharger initiate a TRE.

See the WET Accelerated Monitoring Flow Chart (Figure F-1), below, for further clarification of the accelerated monitoring requirements and for the decision points for determining the need for TRE initiation.

TRE Guidance. The Discharger is required to update its TRE Work Plan in accordance with USEPA guidance. Numerous guidance documents are available, as identified below:

- *Toxicity Reduction Evaluation Guidance for Municipal Wastewater Treatment Plants,* EPA/833B-99/002, August 1999.
- Generalized Methodology for Conducting Industrial TREs, EPA/600/2-88/070, April 1989.
- *Methods for Aquatic Toxicity Identification Evaluations: Phase I Toxicity Characterization Procedures,* Second Edition, EPA/600/6-91/005F, February 1991.
- *Toxicity Identification Evaluation: Characterization of Chronically Toxic Effluents, Phase I*, EPA/600/6-91/005F, May 1992.